

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 February 2001 (08.02.2001)

PCT

(10) International Publication Number
WO 01/10124 A1

(51) International Patent Classification⁷: **H04N 7/173**

(21) International Application Number: PCT/US00/20245

(22) International Filing Date: 25 July 2000 (25.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/365,653 2 August 1999 (02.08.1999) US

(71) Applicant: SUN MICROSYSTEMS, INC. [US/US];
901 San Antonio Road, M/S: UPAL01-521, Palo Alto, CA
94303 (US).

(72) Inventor: **POGGIO, Andrew, A.**; 2708 Gaspar Court,
Palo Alto, CA 94306 (US).

(74) Agents: **HECKER, Gary, A.** et al.; The Hecker Law
Group, Suite 2300, 1925 Century Park East, Los Angeles,
CA 90067 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

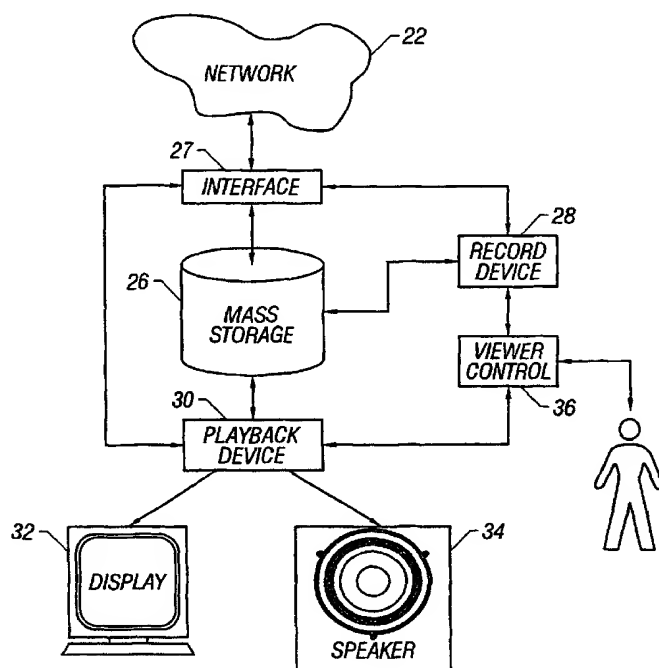
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR PRESENTING VIDEO DATA OBTAINED FROM A NETWORK



(57) Abstract: A method and apparatus for obtaining a video from a network, and presenting the obtained video are disclosed. The method comprises the steps of establishing a connection with a network; selecting a video content to be obtained over the network; receiving data representing the video content via the connection with the network; storing the data representing the video content on a mass storage device; obtaining the data representing the video content from the mass storage device; processing the data representing the video content; and transferring the data representing the video content to a display device for presentation. The apparatus comprises a network interface through which data may be received from a network and transmitted to the network; a data mass storage device; a recording device arranged to store data representing a video obtained via the network interface on the mass storage device; and a playback device arranged to obtain data representing a video from the mass storage device and process the data for presentation by a television.

WO 01/10124 A1

METHOD AND APPARATUS FOR PRESENTING VIDEO DATA OBTAINED FROM A NETWORK

BACKGROUND OF THE INVENTION5 1. FIELD OF THE INVENTION

This invention is in the fields of data networks and audio-visual works.

2. BACKGROUND ART

Consumers are very interested in having the ability to obtain and view a
10 particular video (such as a movie) at any particular time and without needing to
leave their home. This arrangement may be referred to as "video on demand."

Currently, consumers are presented with the following main options for
obtaining video. None of these options provides the desired "video on
15 demand."

First, the consumer can watch broadcast video, such as movies presented
on cable or satellite television. In this arrangement the consumer is not
permitted to pick the time or the video that they desire to watch.

20

A consumer can also go to a store to rent a copy of a video in VHS, DVD
or similar format. In this arrangement, the consumer must leave his or her
home. In addition, the particular video title which the consumer wishes to view
may not be available from the particular video vendor, such as by reason of it
25 being out of stock.

A consumer may be able to access certain video content from the Internet

for presentation on his or her computer monitor. For a number of reasons, the accessible video generally comprises only short video clips in low resolution, often without audio.

5 A first factor which limits the availability of video from the Internet is that the transfer rate is often too slow to permit real-time viewing of the video, especially at the quality of DVD format video. In general, the video quality must be low to reduce the necessary data transfer rate. In addition, real-time viewing of these video clips is often interrupted when the data transfer is
10 interrupted or slowed, or if the information becomes garbled.

In addition, copyright and other rights owners in the video have no convenient and effective means for protecting themselves against pirating of the video which is presented to a viewer over the Internet. Without protection from
15 piracy, owners are unlikely to make available the types of video content which must be purchased in other venues, since copying of such content from the Internet undermines the other markets for the video (such as VHS rentals).

Another problem with viewing video content supplied to a computer
20 from the Internet is that the video is not suited for viewing on a standard television. A viewer is relegated to viewing the video on what may be a small computer monitor. In addition, the computer monitor is unlikely to be positioned in a part of the household which permits viewing by multiple parties, such as several members of a household. For example, the computer may be
25 located in a bedroom or den, not in the living room.

Yet another problem is that the interface of the computer is relatively

unfriendly. A viewer is likely to wish to control the television and video with a remote control from a couch, not with a keyboard and mouse at a desk. The computer also does not include a suitable user interface by which the user can make selections of video content to be obtained and to be played.

SUMMARY OF THE INVENTION

The invention is a method and apparatus for obtaining a video via a network and presenting a video so obtained.

5 In accordance an embodiment of the invention, the method comprises presenting a video at a first location obtained via a network from a second location comprising the steps of establishing a connection with a network; selecting a video to be obtained over the network; transmitting data representing the video content from the second location; receiving the data
10 representing the video content at the first location via the connection with the network; storing the data representing the video content on a mass storage device; obtaining the data representing the video content from the mass storage device; processing the data representing the video content; and transferring the data representing the video content to a display device for presentation thereby.

15

 In one or more embodiments of the invention, the method includes the step of a user paying for the video content, such as before the video content is transmitted. In one or more embodiments of the invention, the data representing the video content is directly transferred to a display device from
20 the network without first being stored.

 One or more embodiments of the invention comprise an apparatus for obtaining and presenting a video. In one embodiment, the apparatus comprises a network interface through which data may be received from a network and
25 transmitted to the network; a data mass storage device; a recording device arranged to store data representing a video obtained via the network interface on the mass storage device; a playback device arranged to obtain data

representing a video from the mass storage device and process the data for presentation by a television into as a viewable video.

In one or more embodiments of the invention, the apparatus is a portion
5 of a system including a television on which the video is presented.

In one or more embodiments, computer hardware and/or software is arranged to one or more aspects of the method of the invention.

10 Further objects, features and advantages of the invention will become apparent from the detailed description of the drawings which follows, when considered with the attached figures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 illustrates an apparatus for obtaining and presenting a video in accordance with an embodiment of the invention;

5 FIGURE 2 is a block diagram of a computer system capable of serving as an apparatus for obtaining and presenting a video in accordance with an embodiment of the invention;

FIGURE 3 is a flow diagram illustrating a method of obtaining a video via
10 a network in accordance with an embodiment of the invention; and

FIGURE 4 is a flow diagram illustrating a method of presenting a video obtained from a network in accordance with an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

The invention is a method and apparatus for obtaining video via a network and for playing or presenting the video to a viewer. In the following description, numerous specific details are set forth in order to provide a more
5 thorough description of the present invention. It will be apparent, however, to one skilled in the art, that the present invention may be practiced without these specific details. In other instances, well-known features have not been described in detail so as not to obscure the invention.

10 Portions of the disclosure of this patent document may contain material that is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure as it appears in the Patent and Trademark Office file or records, but otherwise reserves all copyright rights whatsoever. Sun Microsystems and Java
15 are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International in the United States and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

20

Apparatus for Presenting and Obtaining Video From a Network

An embodiment of the invention comprises an apparatus 20 for use in obtaining video via a network and, in one or more embodiments, presenting the video for viewing by a viewer.

25

As illustrated in Figure 1, the apparatus 20 is arranged to receive data from a network 22. In one or more embodiments, the network comprises the

Internet.

The apparatus 20 includes a network interface 24 for interfacing with the network 22, facilitating the sending and receiving of data. In one or more
5 embodiments, the interface 24 comprises an Ethernet interface, a cable modem or other device permitting the transfer of data at high rates. The interface 24 may also permit wireless transfer of data, such as via a satellite link.

The apparatus 20 includes a data mass storage device 26. In one or more
10 embodiments the mass storage device 26 is of the read/write variety, permitting data to be stored on the device, read therefrom, and selectively removed or erased therefrom. In one or more embodiments, the mass storage device 26 comprises a hard drive, a read/write optical disk or one or more other mass storage devices well known to those of skill in the art now known or later
15 developed.

A recording device 28 communicates with the network interface 24 and mass storage device 26. The recording device 28 is arranged to control the network interface 24, causing information obtained over the network therewith
20 to be directed to and stored on the mass storage device 26 and/or directed to the playback device 30.

In one or more embodiments, the apparatus 20 includes a playback device 30. The playback device 30 is arranged to obtain data from the mass storage device 26 and provide the data in a format which is compatible with a display
25 device. For example, as described in more detail below, when the display device is a standard analog television, this format may be NTSC or PAL. The format may be compatible with digital television known as DTV or HDTV. The format

may also be compatible with such devices supporting a broad range of resolutions.

The visual or video portion of the work is presented to a viewer on a display 32. In one or more embodiments, the display comprises a standard analog television. The display device 32 may also comprise a digital television.

In one or more embodiments, audio associated with the video, if any, is arranged to be presented by an audio system 34. The audio system 34 may comprise a standard stand-alone home audio system, an integrated or unintegrated home theater system, speakers associated with a television or other audio producing devices, as well known in the art.

In one or more embodiments, the apparatus 20 includes a user or viewer control 36. The control 36 includes a user-interface by which a user of the apparatus 20 may control it. The control 36 is arranged to control both the recording device 28 and the playback device 30.

In one or more embodiments, the control 36 includes a means for providing information to a viewer on the display 32 and a means for receiving or accepting commands from the viewer. These means may comprise a remote-control signal receiver and a processor for processing instruction signals.

In one or more embodiments, the apparatus 20 may be arranged to receive instructions from an infra-red or other wireless remote control as is well known in the art. In one or more embodiments, the means for receiving commands may comprise an interface for receiving instruction signals from a

variety of other input devices, such as a touch-screen or the like. The means for accepting commands is in turn coupled to a processing device which is arranged to control the recording and playback devices 28,30 based on the received commands.

5

The means for providing information to a viewer may comprise a processor or other device arranged to provide data to the display 32. For example, this means may cause the display of a selection menu for use by the viewer in determining which of a variety of commands the viewer wishes to select from. The means may also be arranged to provide audible information, such as over the audio system 34 associated with the apparatus 20.

Referring to Figure 2, one or more portions of an embodiment of the invention can be implemented as computer software in the form of computer readable code executed on a computer 100 or other device, or in the form of
15 bytecode class files executable within a Java™ runtime environment running on such a computer or other device, or in the form of bytecodes running on a processor (or devices enabled to process bytecodes) existing in a distributed environment (e.g., one or more processors on a network).

20

The computer 100 illustrated in Figure 2 includes a keyboard 110 and mouse 111 coupled to a system bus 118. The keyboard and mouse are for introducing user input to the computer system and communicating that user input to processor 113. Other suitable input devices may be used in addition to, or in place of, the mouse 111 and keyboard 110. I/O (input/output) unit 119
25 coupled to system bus 118 represents such I/O elements as a printer, A/V (audio/video) I/O, etc.

Computer 100 includes a video memory 114, main memory 115 and mass storage 112, all coupled to system bus 118 along with keyboard 110, mouse 111 and processor 113. The mass storage 112 may include both fixed and removable media, such as magnetic, optical or magnetic optical storage systems or any other available mass storage technology. Bus 118 may contain, for example, thirty-two address lines for addressing video memory 114 or main memory 115. The system bus 118 also includes, for example, a 64-bit data bus for transferring data between and among the components, such as processor 113, main memory 115, video memory 114 and mass storage 112. Alternatively, multiplex data/address lines may be used instead of separate data and address lines.

In one embodiment of the invention, the processor 113 is a microprocessor manufactured by Sun Microsystems, Inc., such as the SPARC™ microprocessor, or a microprocessor manufactured by Motorola, such as the 680X0 processor, or a microprocessor manufactured by Intel, such as the 80X86, or Pentium processor. However, any other suitable microprocessor or microcomputer may be utilized. Main memory 115 is comprised of dynamic random access memory (DRAM). Video memory 114 is a dual-ported video random access memory. One port of the video memory 114 is coupled to video amplifier 116. The video amplifier 116 is used to drive the cathode ray tube (CRT) raster monitor or display 117. Video amplifier 116 is well known in the art and may be implemented by any suitable apparatus. This circuitry converts pixel data stored in video memory 114 to a raster signal suitable for use by monitor 117. Monitor 117 is a type of monitor suitable for displaying graphic images.

Computer 100 may also include a communication interface 120 coupled to bus 118. Communication interface 120 provides a two-way data communication coupling via a network link 121 to a local network 122. For example, if communication interface 120 is an integrated services digital network (ISDN) card or a modem, communication interface 120 provides a data communication connection to the corresponding type of telephone line, which comprises part of network link 121. If communication interface 120 is a local area network (LAN) card, communication interface 120 provides a data communication connection via network link 121 to a compatible LAN. Wireless links are also possible. In any such implementation, communication interface 120 sends and receives electrical, electromagnetic or optical signals which carry digital data streams representing various types of information.

Network link 121 typically provides data communication through one or more networks to other data devices. For example, network link 121 may provide a connection through local network 122 to local server computer 123 or to data equipment operated by an Internet Service Provider (ISP) 124. ISP 124 in turn provides data communication services through the world wide packet data communication network now commonly referred to as the "Internet" 125. Local network 122 and Internet 125 both use electrical, electromagnetic or optical signals which carry digital data streams. The signals through the various networks and the signals on network link 121 and through communication interface 120, which carry the digital data to and from computer 100, are exemplary forms of carrier waves transporting the information.

25

Computer 100 can send messages and receive data, including program code, through the network(s), network link 121, and communication interface

120. In the Internet example, remote server computer 126 might transmit a requested code for an application program through Internet 125, ISP 124, local network 122 and communication interface 120. The received code may be executed by processor 113 as it is received, and/or stored in mass storage 112, or
5 other non-volatile storage for later execution.

Application code may be embodied in any form of computer program product. A computer program product comprises a medium configured to store or transport computer readable code, or in which computer readable code may
10 be embedded. Some examples of computer program products are CD-ROM disks, ROM cards, floppy disks, magnetic tapes, computer hard drives, servers on a network, and carrier waves.

In an embodiment where the apparatus 20 includes a computer 100 as
15 described above, the network interface 24 of the apparatus 20 may comprise the communications interface 120 of the computer 100, whereby the computer 100 may access the network 22, which as described above may comprise a local area network 122 or the Internet 125.

20 In such an embodiment, the mass storage device 26 may comprise the mass storage 112 of the computer 100. The playback and record devices 28 may comprise the CPU 113 and software executed by the CPU 113.

The controller 36 of the apparatus 20 of the invention may comprise the
25 CPU 113, software executed on the CPU, and one or more user input devices which are connected to the computer 100 and which permits the user to control it. In one or more embodiments, the input device advantageously comprises a

remote control or other wireless transmitter/receiver pair associated with the CPU 113. The wireless transmitter/receiver pair may be directly associated with the television which comprises the display 32 on which the video is presented, but also linked to the CPU 113.

5

In such an arrangement, data representing an audio-visual work may be obtained from the network 22 and stored on the mass storage 112 of the computer 100. The CPU 113 may, upon appropriate instruction of a user, obtain data from the mass storage 112 and deliver it to the display device, whereby the
10 video portion of the work is displayed or presented to a viewer over the television comprising the display 32. The audio portion of the work, if any, may be presented over an audio system (such as speakers associated with a home audio or home theater system, as described above but not shown) controlled by the computer 100, such as with an audio driver.

15

In one or more embodiments of the invention, a computer 100 such as that described above is interfaced with a television set and/or home audio system to provide the viewer with an optimum viewing environment and to overcome the problems referred to in the Background. In such an embodiment,
20 the CPU 113 is be arranged to send video data to a television set via a scan converter which converts SVGA output to NTSC or PAL output. This output may be sent from the CPU 113 to the television set by cable/wire or wireless transmission, as known to those of skill in the art.

25

When the television includes one more speakers, audio may be presented over those speakers. Alternatively, the CPU 113 may be arranged to provide audio output to a separate home stereo system having a receiver and one or

more speakers. The audio signal may be provided to the speakers or other sound system via cable/wire or wireless transmission.

In one or more embodiments of the invention, one or more elements of a computer 100 such as that described above may be combined with a television and/or home audio system to form a hybrid system for accomplishing the method of the invention. For example, a television may be provided with the network interface 24, mass storage device 26, playback and record devices 28, and controller 36, directly therein. In one or more other embodiments, the apparatus 20 comprises a television set-top device.

The systems and devices described above are for purposes of example only. An embodiment of the invention may be implemented on a variety of devices including computer system or other programming or processing environment.

As will be appreciated by those of skill in the art, there is a wide variety of configurations for hardware and software for accomplishing the method of the invention other than that described above.

20 Method of Presenting and Obtaining Video From a Network

An embodiment of the invention comprises a method for obtaining video via a network. One or more embodiments of the invention comprise a method of presenting a video.

25 One or more of the embodiments of the method may be implemented on an apparatus such as that described above.

Figure 3 illustrates an embodiment of the invention whereby a video is obtained from a network. A first step S1 of the method comprises initiating video retrieval. In one or more embodiments, a user or viewer interacts with the controller 36 to make a selection of one or more videos which the viewer
5 wishes to download.

As will be appreciated by those of skill in the art, this may be accomplished in a variety of ways. For example, the viewer may highlight or select a menu item (such as an "Obtain Video" selection) which causes the
10 apparatus 20 to connect to the network to obtain data. This step may include the step of the controller 36 causing the recording device 28 to cause the network interface device 24 to connect to the network 22.

A step S2 comprises forming a connection with a video work data
15 provider via a network. In one or more embodiments, the connection is provided by the network interface 24 as described above, and the network 22 comprises the Internet.

The video data provider may comprise a commercial service having one
20 or more servers connected to the network. The video data provider is arranged to provide data over the network to one or more users. In one or more embodiments, the data comprises a data stream representing video and audio of a movie or other audio/visual work. This data may be provided in a variety of forms/formats.

25

In a third step S3 of the method, a user selects the content to be received from the data provider. In one or more embodiments, the video provider

provides information to the viewer regarding the video data which may be downloaded. For example, the video provider may transmit over the network data comprising a list of all of the available videos and the fee charged for obtaining a particular video.

5

The information which is transmitted by the provider may be in the form of a menu list or the like which is presented, via the controller 36, on the display 32 to the viewer. The viewer then transmits, via the network interface 24, an instruction regarding the particular video or videos which are to be obtained.

10

In one or more embodiments of the invention, the method includes the step of the user paying for the video content before it is made available to the user. For example, a user may be billed for the video or the user may send, via the network 22, credit card information.

15

In a step S4, the data representing the video (or videos) which was selected by the user is obtained via the network 22 and stored on the mass storage device 26. In accordance with this step, the video provider sends the data to the mass storage device 26 via the network 22. In one or more
20 embodiments, the data represents video and audio of a particular work.

Additional data aside from the video and/or audio data may be provided to the user. For example, when the video and other data is encrypted, decryption information may also be sent to the user for use by the playback or
25 other device in decrypting the video data for playback.

The data which is provided by the video provider passes over the

network 22 via the network interface 24. In one arrangement, the recording device 28 causes the data to be stored, such as by writing, to the mass storage device 26. In another arrangement, the data may be played back directly, such as by having the data transferred directly from the interface 24 to the playback device 30 (see Figure 1).'

Figure 4 illustrates a method of presenting a video, such as a video obtained from a network as described above, in accordance with an embodiment of the invention. In a first step S5, the playback of a video is initiated. In one or more embodiments, this comprises a viewer instructing the apparatus 20 to initiate the playback of a video. For example, the viewer may select a particular video from a menu screen listing the videos which are currently stored on the mass storage device 26 and available for playback.

In a step S6, the data representing the video is obtained from the mass storage device 26 by the playback device 30. In one or more embodiments this step includes the step of the controller 36 causing the playback device 30 to read information from the mass storage device 26.

In a step S7, the data is processed. In one or more embodiments, this step comprises decompressing the data, if the data is compressed.

In one or more embodiments, the processing step comprises the step converting the data to another format. For example, when the display device 32 is a standard analog television, the processing step may comprise the step of converting data from an SVGA format to an NTSC or PAL format.

In one or more embodiments, the processing step comprises the step of decrypting data which is encrypted. As described above, the data which is transmitted by the video provider may be encrypted to prevent use of the data by other than the viewer or other authorized person. This may be useful, for example, in preventing the data from being intercepted and played by others. As described, the video provider may provide decryption data, such as a key, for use in decrypting the data for playback.

In one or more embodiments, the processing step comprises the step of copy protecting the data. For example, the playback device 30 may be arranged to encode the data, such as by adding copy protect or prevent instruction data, which when read by a device is arranged to prevent the device from copying the data, to prevent only a single generation copy, or to prevent the exact duplication of the data. Such copy protection schemes are well known. In one ore more embodiments, copy prevention "encoding" is accomplished after decrypting the data.

In one or more embodiments, the encoding is an analog-type encoding process such as that developed by Macrovision Corporation of Sunnyvale, California. Such encoding is adapted to permit a television to display the encoded video content, but generally prevent a VCR or similar device from recording or copying the data.

In a step S8 the data is provided to the display 32 for viewing by a viewer. In one or more embodiments, this step comprises transmitting the data to the display 32, such as over a cable or other connection. The data may also be transmitted to the display 32 via a wireless receiver/transmitter pair.

The step S8 also includes, in one or more embodiments, providing data to the audio system 34 for presenting audio information to the viewer.

5 In accordance with one or more embodiments of the invention, the apparatus 20 as described above is arranged so that the playback and record functions described may occur simultaneously. In such an arrangement, steps S5-S8 may begin before the completion of step S4. As an example, a viewer may download a first video and then instruct the apparatus 20 to download a second
10 video. While the data representing the second video is obtained from the provider and stored on the mass storage device 26, the viewer may instruct the apparatus 20 to playback the first video.

 In such an arrangement, it is desirable for the mass storage device 26 to
15 have sufficient storage capacity to store the data associated with more than one video. A digital versatile disk (DVD) generally provides information at a rate of about 5 megabits per second. If the apparatus of the present invention is arranged to provide the same data rate to present the video and the video lasts approximately two hours in duration, the total data representing the video is
20 approximately 4.5 gigabytes. Thus, the mass storage device 26 should be capable of storing at least 4.5 gigabytes of information. The mass storage device 26 may be large enough to store two or more videos in their entirety.

 The apparatus and method of the invention permit a viewer to obtain, at
25 any time, a particular video content. In this manner, the invention achieves the desired "video on demand."

The apparatus 20 and system of the invention may permit a user to obtain “customized” video content. For example, if a user wishes to obtain only the weather and sports portions of a news program, the viewer may select those elements from a menu. Those selected portions only may then be transferred to the viewer for viewing.

The apparatus and method of the invention provides security to those holding rights in the video and/or audio represented by the data. In particular, the apparatus and method permit the data provider to encode or encrypt the data to prevent both the unauthorized playback and unauthorized duplication of the data. Numerous other security measures can be imposed.

The apparatus and method of the invention permit viewers to obtain video on demand with a system which includes as many of its major components well known and commonly owned technology.

The arrangement of the invention assures that a particular video is not out of stock, as may occur at a video store. This is because the data representing the video can be stored on a server and delivered at any time to an unlimited number of requesters.

The apparatus and method of the invention permit a viewer to obtain the video at a transfer rate which is lower than the rate which is actually needed to produce or present the video. For example, while the data rate for a DVD type movie is average 5 megabits per second, the transfer rate of the data over the network to the consumer may average only about 1.5 megabits per second. In the arrangement of the invention, however, the data representing the video

does not need to be provided at the display rate, since the data is stored first and then displayed.

As a result of the “store and then present” arrangement of a video in accordance with the invention, video presentation is not sensitive to delays in data transfer over the network, and is not susceptible to problems resulting from dropped packets of information or out-of-order packets. In addition, the video presentation is not suspended in the event the network connection is lost. In the event of a network disconnection, the apparatus 20 may be arranged to reconnect and download the remaining data representing the video.

Of course, the time needed to download the data representing a particular video is dependent upon a number of factors, such as the length of the movie, what compression is used, download speed and the like.

15

In one or more embodiments, it is possible to begin viewing a particular video before it is completely received and stored in mass storage. The apparatus 20 may, for example, be arranged to permit a user to view a particular video after the apparatus 20 determines, based on the transfer rate and amount of data already downloaded and stored, that the video can be presented without interruption. The apparatus 20 may be arranged to permit a user to view a particular video at different levels of resolution. For example, if a user wishes to view a video at less than DVD quality, the apparatus 20 may permit the viewer to begin viewing the video much before the content is completely downloaded than as compared to where the user wishes to view the video at the higher data-requirement DVD quality.

25

In accordance with one arrangement of the invention, the data representing the video need not be transferred to the viewer immediately. Instead, after multiple requests have been received or after some predetermined period of time, the video provider may send the video data to multiple requesters at the same time. This arrangement avoids sending multiple sets of the same data, saving network bandwidth and permitting, for example, more data representing other videos to be transferred at the same time to other requesters.

As another aspect of the invention, the apparatus 20 may be arranged to both permit a user to download a video at a time in the future, or send a video to another location or party. In such an arrangement, the user communicates with the video provider through the apparatus 20, such as by menu, supplying requisite information to facilitate the transfer.

Of course, the foregoing description is that of preferred embodiments of the invention, and various changes and modifications may be made without departing from the spirit and scope of the invention, as defined by the claims.

CLAIMS OF THE INVENTIONWHAT IS CLAIMED IS:

1. A method of presenting a video at a first location obtained via a network from a second location comprising the steps of:
 - 5 establishing a connection with said network;
 - selecting a video content to be obtained over said network;
 - transmitting data representing said video content from said second location;
 - receiving said data representing said video content at said first location via
 - 10 said connection with said network;
 - storing said data representing said video content on a mass storage device;
 - obtaining said data representing said video content from said mass storage device;
 - 15 processing said data representing said video content; and
 - transferring said data representing said video content to a display device for presentation thereby.
2. The method in accordance with Claim 1 wherein said step of
- 20 processing said data representing said video content comprises the step of decrypting said data representing said video content.
3. The method in accordance with Claim 1 wherein said step of
- processing said data representing said video content comprises the step of
- 25 decompressing said data representing said video content.

4. The method in accordance with Claim 1 wherein said step of processing said data representing said video content comprises converting said data representing said video content to a format presentable by a display device.

5 5. The method in accordance with Claim 1 further comprising the steps of transmitting data representing audio content associated with said video from said second location, storing said data representing said audio content, and transmitting said data representing audio content to a sound generating device.

10 6. The method in accordance with Claim 1 including the step of presenting said data representing said video content on a television.

7. An apparatus for obtaining a video via a network and presenting said video to one or more viewers comprising:

15 a network interface through which data may be received from a network and transmitted to said network;
a data mass storage device;
a recording device arranged to store data representing a video obtained via said network interface on said mass storage device;
20 a playback device arranged to obtain data representing a video from said mass storage device and process said data for presentation by a display device as a viewable video.

8. The apparatus in accordance with Claim 7 including a wireless emitter-receiver pair for permitting a user to interact with said recording and
25 playback devices.

9. The apparatus in accordance with Claim 7 wherein said playback device is arranged to convert said data to a format acceptable for presentation by a television.

5 10. The apparatus in accordance with Claim 7 wherein said playback device is arranged to decompress said data.

11. The apparatus in accordance with Claim 7 wherein said playback device is arranged to encode said data to prevent copying thereof.

10

12. A system for obtaining and presenting a video comprising:
a network interface through which data may be received from and transmitted to a network;

a data mass storage device;

15 a television;

a recording and playback device, the recording and playback device arranged to store data representing a video obtained via said network interface on said mass storage device and arranged to obtain data representing said video from said mass storage device and process and transmit the data to said

20 television; and

a user interface permitting the user to control the recording and playback device.

13. The system in accordance with Claim 12 wherein said mass storage
25 device comprises a hard drive of a computer.

14. The system in accordance with Claim 12 wherein said user interface comprises a remote control device associated with said television.

15. The system in accordance with Claim 12 wherein said playback
5 device is arranged to copy-protect said data representing said video.

16. The system in accordance with Claim 12 wherein said playback device is arranged to decompress said data representing said video when compressed.

10

17. A method of obtaining and presenting a video comprising:
establishing a connecting with a video content provided over a network
with a network interface;

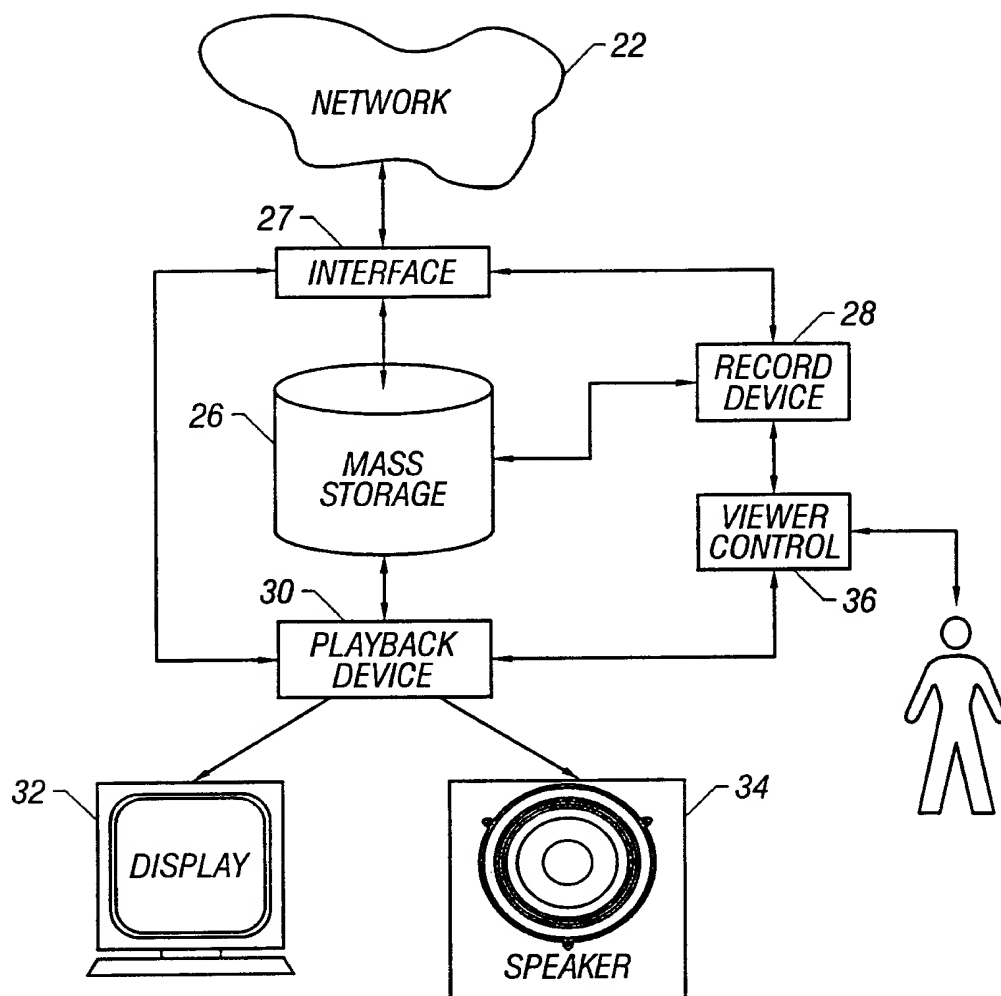
selecting data representing a video content to be obtained;
15 receiving said data representing said video content via a network
interface;

storing said data representing said video content on a hard drive
associated with a computer;

obtaining said data representing said video content from said hard drive;
20 processing said data at said computer;
transmitting said data from said computer to a television set; and
presenting said video on said television.

18. The method in accordance with Claim 17 wherein said step of
25 processing said data comprises converting said data representing said video
content from a digital to an analog format.

1/3

**FIGURE 1**

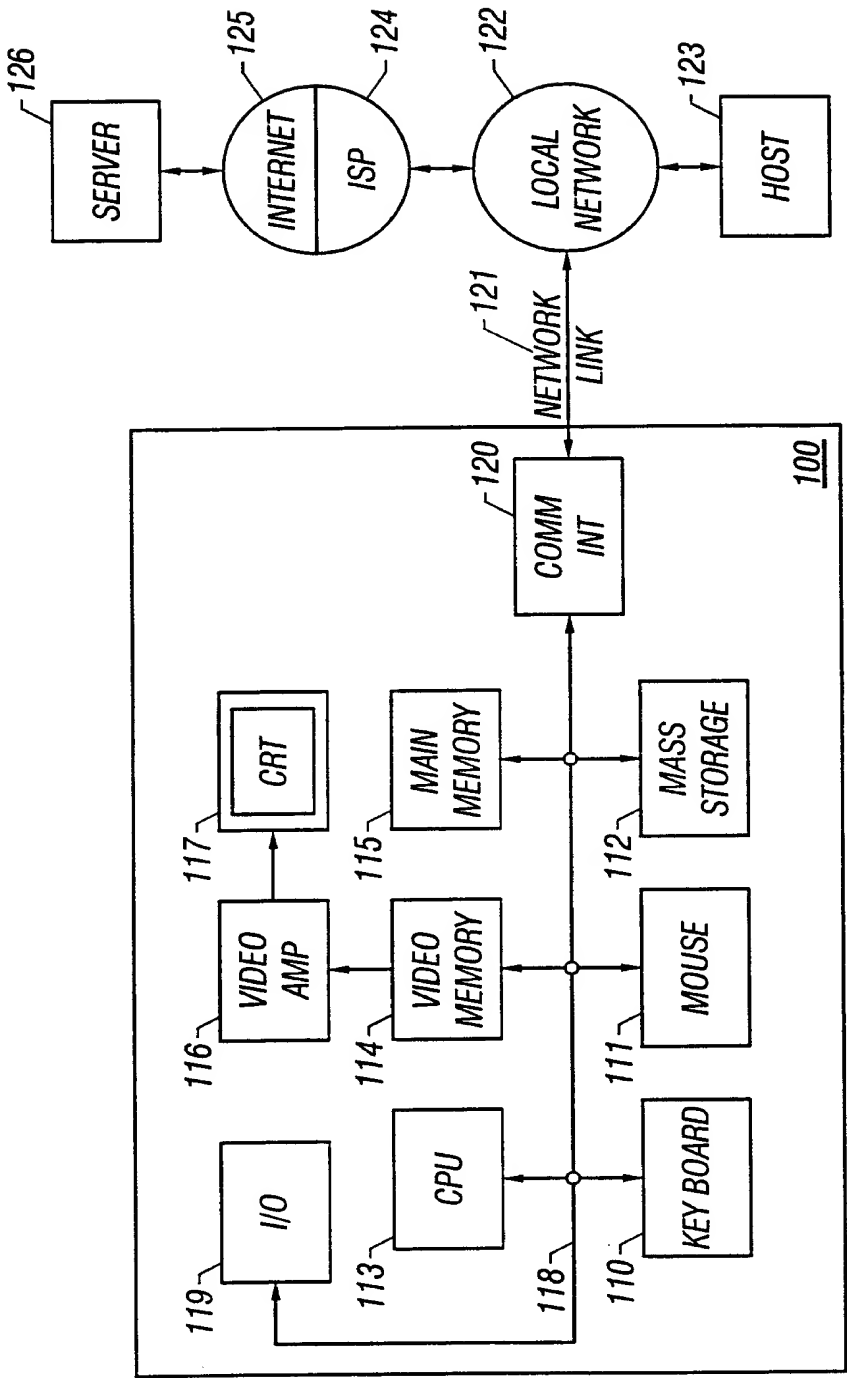
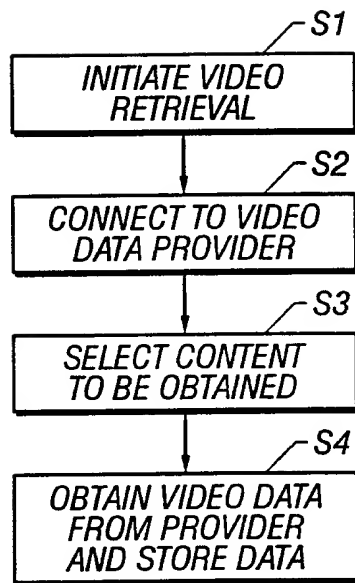
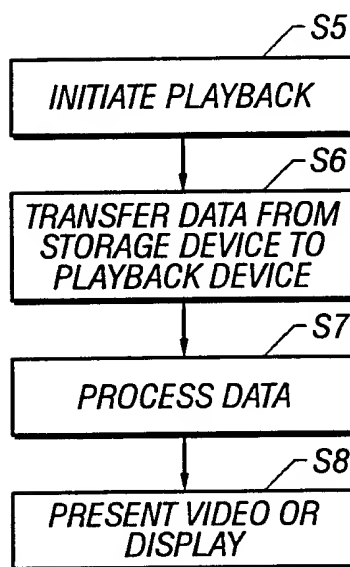


FIGURE 2

3/3

**FIGURE 3****FIGURE 4**

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/20245

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N7/173

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 5 761 607 A (GUDESEN HANS GUDE) 2 June 1998 (1998-06-02) the whole document ---	1-10, 12, 14, 16 11, 13, 15, 17, 18
X A	US 5 132 992 A (YURT PAUL ET AL) 21 July 1992 (1992-07-21) column 2, line 26 -column 3, line 14 column 3, line 50 -column 5, line 58 column 17, line 67 -column 18, line 45 abstract; claims 25, 29-31; figure 6 --- -/--	1, 3-12, 14-16 2, 13, 17, 18

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

18 December 2000

Date of mailing of the international search report

27/12/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

La, V

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/20245

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 835 843 A (HADDAD JOSEPH C) 10 November 1998 (1998-11-10) column 2, line 9 -column 3, line 27 column 6, line 36 -column 7, line 24 abstract	1-3,5-7, 10,12, 13,16-18
A	----- US 5 583 561 A (BAKER DONN B ET AL) 10 December 1996 (1996-12-10) column 8, line 17 - line 41 abstract -----	4,8,9, 11,14,15
A		1-18

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/20245

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5761607 A	02-06-1998	AT 167605 T AU 702798 B AU 5051596 A AU 7711194 A BR 9407459 A CA 2171316 A CN 1133665 A DE 69411179 D DE 69411179 T DK 717908 T EP 0717908 A ES 2118438 T FI 961068 A JP 9502324 T NO 960935 A WO 9507592 A RU 2138924 C SG 49348 A	15-07-1998 04-03-1999 13-06-1996 27-03-1995 12-11-1996 16-03-1995 16-10-1996 23-07-1998 21-01-1999 19-10-1998 26-06-1996 16-09-1998 07-03-1996 04-03-1997 08-03-1996 16-03-1995 27-09-1999 18-05-1998
US 5132992 A	21-07-1992	AT 186437 T AU 1197092 A DE 69230250 D DE 69230250 T DK 566662 T EP 0566662 A EP 0933892 A ES 2138968 T GR 3032463 T JP 6501601 T MX 9200041 A WO 9212599 A US 6144702 A US 5550863 A US 6002720 A US 5253275 A	15-11-1999 17-08-1992 09-12-1999 13-07-2000 10-04-2000 27-10-1993 04-08-1999 01-02-2000 31-05-2000 17-02-1994 01-10-1992 23-07-1992 07-11-2000 27-08-1996 14-12-1999 12-10-1993
US 5835843 A	10-11-1998	US 5555441 A US 6072982 A AU 3624995 A WO 9604753 A	10-09-1996 06-06-2000 04-03-1996 15-02-1996
US 5583561 A	10-12-1996	DE 69509523 D DE 69509523 T EP 0764381 A JP 10501389 T WO 9534169 A	10-06-1999 02-09-1999 26-03-1997 03-02-1998 14-12-1995